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LEE & HAYES PLLC
421 W RIVERSIDE AVENUE SUITE 500
SPOKANE, WA 99201

EXAMINER	
SANDERS, AARON J	

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2168	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,159	ZENG ET AL.	
	Examiner	Art Unit	
	AARON SANDERS	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-31 and 33-40* is/are rejected.

7)☒ Claim(s) *11 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/18/2007, 03/19/2008, and 04/23/2008.

DETAILED ACTION

Response to Amendment

The amendment filed 19 March 2008 has been entered. Claims 1-40 are pending. Claims 1-9, 11-15, 17-24, 26, 28-30, and 33-40 are currently amended. No claims are cancelled. No claims are new. This action is FINAL, as necessitated by amendment.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method of claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

As per claim 17, for consistency, the phrase "for iteratively clustering" should be "for the iteratively clustering."

As per claim 22, the term "tangible computer-readable data storage medium" is not defined in the specification. Terms such as "computer-readable storage medium" or "computer storage medium" are, however, and would therefore be more appropriate in the instant claim.

Claim 36 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, the step of "determining a search term suggestion from the reinforced clusters responsive to receipt of a bid term" was performed by the step of "utilizing the reinforced clusters to respond to a bid term from a user with search terms relevant to the bid term" in claim 34.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 34-40 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per claims 34-40, the instant claims are directed to software *per se*. Independent claim 34 recites a computer program *per se* and functional descriptive material consisting of data structures and computer programs, which impart functionality when employed as a computer component. As such, the instant claims are not limited to statutory subject matter and are therefore non-statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1-10, 12-31, and 33-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al., U.S. 2002/0165849 (Singh), in view of Schuetze et al., U.S. 2003/0110181 (Schuetze).

1. Singh teaches "*A computer-implemented method comprising*," see ¶ 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term.'"

Singh teaches "*determining a bid term, the bid term associated with multi-type data objects*," see ¶ 245, "In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

Singh teaches "*and utilizing, by a search term suggestion module... to respond to the bid term from a user with search terms relevant to the bid term*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms... Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*utilizing... the reinforced clusters*." Schuetze does, however, see Fig. 12 and ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms... The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text... As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*identifying relationships among the multi-type data objects, wherein the multi-type data objects comprise at least one object of a first type and at least one object of a second type different from the first type*." Schuetze does, however, see Fig. 10, ¶ 141, "Its similarity is calculated with respect to each cluster center (step 1014), using one of the similarity metrics set forth above. The object is then assigned to the nearest cluster center (step 1016)," and ¶ 30, "This approach is relevant to data sets where each object has several disparate types of information associated with it, which are called modalities," where the claimed

"identifying relationships" is the referenced similarity calculation and clustering and the claimed "object of a first [second] type" is a referenced "modality." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*iteratively clustering the multi-type data objects by at least one of the identified relationships to generate reinforced clusters*." Schuetze does, however, see ¶ 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features" and ¶ 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

2. Singh does not teach "*The method of claim 1, wherein the relationships comprise inter-layer relationships including at least one of content related information, user interest in an associated topic, and user interest in an associated Web page.*" Schuetze does, however, see ¶ 32, "The method takes/advantage of multiple ways in which a user can specify items of interest. For example, in images, features from the text and image modalities can be used to describe the images… clustering may be performed on a different feature (e.g., surrounding text, image URL, image color histogram, genre of the surrounding text)." Thus, it would have been obvious to one

of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

3. Singh does not teach "*The method of claim 1, wherein the relationships comprise intra-layer relationships including at least one of query refinement, recommended Web page, and relationship between respective users.*" Schuetze does, however, see ¶ 28, "It is also useful to be able to track individuals' information access habits by way of the characteristics of the documents those users access, thereby enabling a recommendation system in which users are assigned to similar clusters. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35."

4. Singh does not teach "*The method of claim 1, wherein each of the multi-type data objects are related to at least one of a search query data object type, a selected Web page type, and a user information type.*" Schuetze does, however, see ¶ 37, "Multi-modal features may take on many forms, such as user information, text genre, or analysis of images." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

5. Singh does not teach "*The method of claim 1, wherein the at least one of the identified relationships are weighted to indicate importance to associated objects of the multi-type data objects.*" Schuetze does, however, see ¶ 33, "various document features in different modalities

are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

6. Singh does not teach "*The method of claim 1, wherein the identifying and the iteratively clustering are performed for search term suggestions*." Schuetze does, however, see ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

7. Singh does not teach "*The method of claim 1, wherein the iteratively clustering comprises propagating clustering results of a first iteration to all related data objects of the multi-type data objects, at least two of the related data objects being of heterogeneous data type, the propagating being used to enhance clustering of respective ones of the multi-type data objects in a second iteration of reinforced clustering operations*." Schuetze does, however, see ¶ 152, "Scatter/Gather iteratively refines a search by 'scattering' a collection into a small number of clusters, and then a user 'gathers' clusters of interest for scattering again. The Scatter/Gather method is extended by the invention to extend to a multi-modal, multi-feature method, using

both text and image features to navigate a collection of documents with text and images." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

8. Singh does not teach "*The method of claim 1, wherein the iteratively clustering further comprises determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of inter-object and intra-object content similarity and similarities between the at least one of the identified relationships*." Schuetze does, however, see ¶ 3, "The invention relates to… an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

9. Singh does not teach "*The method of claim 1, wherein the iteratively clustering comprises merging related ones of the multi-type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

10. Singh does not teach "*The method of claim 1, wherein the method further comprises mutually reinforcing an importance of individual ones of the multi-type data objects within an object type and between different object types*." Schuetze does, however, see ¶ 97, "The use of token, frequency weight and inverse context frequency weight for the embedding employed by the invention is consistent with the following intuitive description. Each additional occurrence of an element (or word, for example) in a context (e.g., a document) reflects an increased level of importance for that element as a descriptive feature." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

12. Singh teaches "*The method of claim 1, wherein the utilizing the reinforced clusters comprises: responsive to receiving the bid term from a user, comparing the bid term with a feature space of objects in the reinforced clusters*," see ¶ 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*responsive to comparing, identifying one or more search term suggestions*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Singh teaches "*and communicating the search term suggestions to the user*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms to assist the advertiser in locating search terms relevant to the content of the advertiser's web site."

13. Singh teaches "*A computing device comprising*," see ¶ 189, "FIG. 1 is an example of a distributed system 10 configured as client/server architecture."

Singh teaches "*a processor*," see ¶ 192, "Each client 12 typically includes one or more processors."

Singh teaches "*and a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for*," see ¶ 192, "Each client 12 typically includes one or more… memories."

Singh teaches "*and utilizing, by a search term suggestion module… to respond to the bid term from a user with search terms relevant to the bid term*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*utilizing… the reinforced clusters*." Schuetze does, however, see Fig. 12 and ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*identifying relationships among multi-type data objects, wherein the multi-type data objects comprise at least one object of a first type and at least one object of a second type different from the first type.*" Schuetze does, however, see Fig. 10, ¶ 141, "Its similarity is calculated with respect to each cluster center (step 1014), using one of the similarity metrics set forth above. The object is then assigned to the nearest cluster center (step 1016)," and ¶ 30, "This approach is relevant to data sets where each object has several disparate types of information associated with it, which are called modalities," where the claimed "identifying relationships" is the referenced similarity calculation and clustering and the claimed "object of a first [second] type" is a referenced "modality." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*iteratively clustering the multi-type data objects by at least one of the relationships to generate reinforced clusters, each relationship of the relationships being weighted to indicate an importance to associated objects of the multi-type data objects.*" Schuetze does, however, see ¶ 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features," ¶ 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," and ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to

one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

14. Singh does not teach "*The computing device of claim 13, wherein the relationships comprise inter-layer relationships including at least one of content related information, user interest in an associated topic, and user interest in an associated Web page.*" Schuetze does, however, see ¶ 32, "The method takes advantage of multiple ways in which a user can specify items of interest. For example, in images, features from the text and image modalities can be used to describe the images… clustering may be performed on a different feature (e.g., surrounding text, image URL, image color histogram, genre of the surrounding text)." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

15. Singh does not teach "*The computing device of claim 13, wherein the relationships comprise intra-layer relationships including at least one of query refinement, recommended Web page, and relationship between respective users.*" Schuetze does, however, see ¶ 28, "It is also useful to be able to track individuals' information access habits by way of the characteristics of the documents those users access, thereby enabling a recommendation system in which users are assigned to similar clusters." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

16. Singh does not teach "*The computing device of claim 13, wherein identifying an iteratively clustering are performed for search term suggestion*." Schuetze does, however, see ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

17. Singh does not teach "*The computing device of claim 13, wherein the computer-program instructions for iteratively clustering comprise instructions for aggregating data object relationships to related ones of the multi-type data objects based on content of the reinforced clusters*." Schuetze does, however, see ¶ 31, "Each modality within each document is described herein by an n-dimensional vector, thereby facilitating quantitative analysis of the relationships among the documents in the collection" where, see ¶ 76, "As illustrated in FIG. 1, each document (for example, an HTML document 110) chosen from a collection 120 maps to a set of feature vectors 112, one for each modality (for example, a text vector 114 and a URL vector 116)." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

18. Singh does not teach "*The computing device of claim 13, wherein the instructions for the iteratively clustering comprise instructions for determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of inter-object and intra-object content similarity and similarities between the at least one of the identified relationships.*" Schuetze does, however, see ¶ 3, "The invention relates to... an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

19. Singh does not teach "*The computing device of claim 13, wherein the instructions for the iteratively clustering comprise instructions for merging related ones of the multi-type data objects to reduce feature space dimensionality of the related ones.*" Schuetze does, however, see ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

20. Singh does not teach "*The computing device of claim 13, wherein the instructions for the iteratively clustering comprise instructions for iteratively clustering until all object types represented by the multi-type data objects converge.*" Schuetze does, however, see ¶ 78, "the collection 120 comprises all known documents that will ever by [sic] processed by a system

according to the invention" where the "process" is illustrated in Fig. 3 and where "converge" is defined in Applicant's specification paragraph ¶ 74 as, "each type of the different kinds of nodes and links are examined to obtain structural information that can be used for clustering." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

21. Singh teaches "*The computing device of claim 13, wherein the utilizing the reinforced clusters comprises: responsive to receiving the bid term from a user, comparing the bid term with a feature space of objects in the reinforced clusters*," see ¶ 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*responsive to comparing, identifying one or more search term suggestions*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Singh teaches "*and communicating the search term suggestions to the user*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms to assist the advertiser in locating search terms relevant to the content of the advertiser's web site."

22. Singh teaches "*A tangible computer-readable data storage medium comprising computer-executable instructions executable by a processor for*," see ¶ 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term.'"

Singh teaches "*and utilizing, by a search term suggestion module... to respond to the bid term from a user with search terms relevant to the bid term*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms... Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*utilizing... the reinforced clusters*." Schuetze does, however, see Fig. 12 and ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms... The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text... As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*identifying at least one of intra-layer and inter-layer relationships among multi-type data objects, wherein the multi-type data objects comprise at least one object of a first type and at least one object of a second type different from the first type*." Schuetze does, however, see Fig. 10, ¶ 141, "Its similarity is calculated with respect to each cluster center (step 1014), using one of the similarity metrics set forth above. The object is then assigned to the nearest cluster center (step 1016)," and ¶ 30, "This approach is relevant to data sets where each object has several disparate types of information associated with it, which are called modalities,"

where the claimed "identifying relationships" is the referenced similarity calculation and clustering and the claimed "object of a first [second] type" is a referenced "modality." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*iteratively clustering the multi-type data objects by at least one of the relationships to generate reinforced clusters*." Schuetze does, however, see ¶ 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features" and ¶ 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

23. Singh does not teach "*The computer-readable medium of claim 22, wherein the inter-layer relationships comprise at least one of content related information, user interest in an associated topic, and user interest in an associated Web page.*" Schuetze does, however, see ¶ 32, "The method takes advantage of multiple ways in which a user can specify items of interest. For example, in images, features from the text and image modalities can be used to describe the images… clustering may be performed on a different feature (e.g., surrounding text, image URL, image color histogram, genre of the surrounding text)." Thus, it would have been obvious to one

of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

24. Singh does not teach "*The computer-readable medium of claim 22, wherein the intra-layer relationships comprise at least one of query refinement, recommended Web page, and relationship between respective users.*" Schuetze does, however, see ¶ 28, "It is also useful to be able to track individuals' information access habits by way of the characteristics of the documents those users access, thereby enabling a recommendation system in which users are assigned to similar clusters." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

25. Singh does not teach "*The computer-readable medium of claim 22, wherein each of the multi-type data objects are related to at least one of a search query data object type, a selected Web page type, and a user information type.*" Schuetze does, however, see ¶ 37, "Multi-modal features may take on many forms, such as user information, text genre, or analysis of images." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

26. Singh does not teach "*The computer-readable medium of claim 22, wherein the at least one of the identified relationships are weighted to indicate an importance to associated*

objects of the multi-type data objects." Schuetze does, however, see ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

27. Singh does not teach "*The computer-readable medium of claim 22, wherein identifying an iteratively clustering are performed for search term suggestion*." Schuetze does, however, see ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

28. Singh does not teach "*The computer-readable medium of claim 22, wherein the iteratively clustering comprises propagating clustering results of a first iteration to all related data objects of the multi-type data objects, at least two of the related data objects being of heterogeneous data type, the propagating being used to enhance clustering of respective ones of the multi-type data objects in a second iteration of reinforced clustering operations*." Schuetze does, however, see ¶ 152, "Scatter/Gather iteratively refines a search by 'scattering' a collection

into a small number of clusters, and then a user 'gathers' clusters of interest for scattering again. The Scatter/Gather method is extended by the invention to extend to a multi-modal, multi-feature method, using both text and image features to navigate a collection of documents with text and images." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

29. Singh does not teach "*The computer-readable medium of claim 22, wherein the iteratively clustering comprises determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of object content similarity and similarities between the at least one of the identified relationships*." Schuetze does, however, see ¶ 3, "The invention relates to… an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

30. Singh does not teach "*The computer-readable medium of claim 22, wherein the iteratively clustering comprises merging related ones of the multi-type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited

references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

31. Singh does not teach "*The computer-readable medium of claim 22, wherein the instructions further comprise instructions for mutually reinforcing importance of individual ones of the multi-type data objects within an object type and between different object types.*" Schuetze does, however, see ¶ 97, "The use of token frequency weight and inverse context frequency weight for the embedding employed by the invention is consistent with the following intuitive description. Each additional occurrence of an element (or word, for example) in a context (e.g., a document) reflects an increased level of importance for that element as a descriptive feature." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

33. Singh teaches "*The computer-readable medium of claim 22, wherein utilizing the reinforced clusters comprises: responsive to receiving the bid term from a user, comparing the bid term with a feature space of objects in the reinforced clusters,*" see ¶ 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*responsive to the comparing, identifying one or more search term suggestions,*" see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Singh teaches "*and communicating the search term suggestions to the user,*" see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional

related search terms to assist the advertiser in locating search terms relevant to the content of the advertiser's web site."

34. Singh teaches "*A system comprising*," see ¶ 189, "FIG. 1 is an example of a distributed system 10 configured as client/server architecture."

Singh teaches "*and means for utilizing... to respond to a bid term from a user with search terms relevant to the bid term*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*utilizingthe reinforced clusters*." Schuetze does, however, see Fig. 12 and ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*means for identifying relationships between multi-type data objects, wherein the multi-type data objects comprise at least one object of a first type and at least one object of a second type different from the first type*." Schuetze does, however, see Fig.

10, ¶ 141, "Its similarity is calculated with respect to each cluster center (step 1014), using one of the similarity metrics set forth above. The object is then assigned to the nearest cluster center (step 1016)," and ¶ 30, "This approach is relevant to data sets where each object has several disparate types of information associated with it, which are called modalities," where the claimed "identifying relationships" is the referenced similarity calculation and clustering and the claimed "object of a first [second] type" is a referenced "modality." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

Singh does not teach "*means for iteratively clustering the multi-type data objects by at least one of the relationships to generate reinforced clusters*." Schuetze does, however, see ¶ 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features," ¶ 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," and ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

35. Singh does not teach "*The system of claim 34, further comprising means for weighting the at least one of the identified relationships to indicate an importance to associated objects of the multi-type data objects*." Schuetze does, however, see ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

36. Singh teaches "*The system of claim 34, further comprising means for determining a search term suggestion... responsive to receipt of a bid term, the search term suggestion substantially matching or being related to at least one of the multi-type data objects*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*from the reinforced clusters*." Schuetze does, however, see Fig. 12 and ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention

to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

37. Singh does not teach "*The system of claim 34, wherein the means for iteratively clustering comprise means for aggregating to propagate data object relationships to related ones of the multi-type data objects based on content of the reinforced clusters.*" Schuetze does, however, see ¶ 31, "Each modality within each document is described herein by an n-dimensional vector, thereby facilitating quantitative analysis of the relationships among the documents in the collection" where, see ¶ 76, "As illustrated in FIG. 1, each document (for example, an HTML document 110) chosen from a collection 120 maps to a set of feature vectors 112, one for each modality (for example, a text vector 114 and a URL vector 116)." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

38. Singh does not teach "*The system of claim 34, wherein the means for iteratively clustering comprise means for determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of object content similarity and similarities between at least one of the identified relationships.*" Schuetze does, however, see ¶ 3, "The invention relates to... an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

39. Singh does not teach "*The system of claim 34, wherein the means for iteratively clustering comprise means for merging to combine related ones of the multi-type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see ¶ 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

40. Singh teaches "*The system of claim 34, wherein the means for utilizing further comprises: means, responsive to receiving a term from a user, for comparing the term with a feature space of objects in the reinforced clusters*," see ¶ 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*and responsive to comparing, means for identifying one or more search term suggestions*," see ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Allowable Subject Matter

Claims 11 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

As per Applicant's argument that claims 34-40 are statutory under 35 U.S.C. 101, the Examiner respectfully disagrees. While the preamble of the claims may recite a system, the claim limitations do not recite any hardware. Further, the recited "means" are not defined in the specification as exclusively hardware. Thus, there is no reason to assume that the claim limitations are actually embodied in hardware.

As per Applicant's argument that Schuetze does not teach "determining a bid term, the bid term associated with multi-type data objects" as recited in claim 1, the Examiner agrees, And has cited Singh ¶ 245, "In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser" instead.

As per Applicant's argument that Schuetze does not teach "and utilizing, by a search term suggestion module… to respond to the bid term from a user with search terms relevant to the bid term" as recited in the independent claims, the Examiner agrees. The Examiner has now cited Singh ¶ 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software" as teaching the claimed subject matter. Singh does not teach "utilizing… the reinforced clusters," however. Schuetze does, see Fig. 12 and ¶ 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the

existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see ¶ 35.

As per Applicant's argument that Schuetze does not teach the limitations of claim 12, the Examiner agrees, and has cited Singh ¶ 245. The Examiner notes, however, that the limitations of claim 12 have not been included in the independent claims, and do not therefore make the claims allowable.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Aaron Sanders whose telephone number is 571-270-1016. The Examiner can normally be reached on M-Th 8:00a-5:00p.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Tim Vo can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron Sanders/
Examiner, Art Unit 2168
7 July 2008

/S. P./
Primary Examiner, Art Unit 2164